Thesis: A Dosimetric Model for Small-Field Electron Radiation Therapy

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Degree: Master of Arts

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Date: November, 2008

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The collection of patient specific dosimetric data is a time consuming but necessary process for radiation therapy treatments using small-electron fields. This paper presents data that has been measured for specific field shapes and sizes that closely approximately many of those used clinically. The data presents cutout factors and beam profiles constructed from measurements obtained with a 2-D array. For use clinically, the patient's field will be compared to that of one of the small-electron fields created in this research. Use of the beam profiles will allow the clinicians to optimally design small-electron fields knowing the radiation field width and beam penumbras. The penumbras ranged from 5.75 mm for a 3-cm x 3-cm 100-cm SSD 15-MeV square to 15.75 mm for a 3-cm 110-cm SSD 6-MeV circle. This data matches the theory for penumbra characteristics for electron fields.